A LARGER PIE THROUGH A FAIR SHARE?
GENDER EQUALITY AND ECONOMIC PERFORMANCE

A Geske Dijkstra

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For further information contact:
ORPAS - **Institute of Social Studies** - P.O. Box 29776
2502LT The Hague - The Netherlands - FAX: +31 70 4260799
E-mail: **workingpapers@iss.nl**

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ABSTRACT

Is gender equality of influence on economic development? Based on insights from feminist macroeconomics, the paper develops a framework that suggests that the gendered distribution of the pie does matter for its size. However, in order to assess the relationship, we need a good measure of gender equality that is not influenced by absolute levels of development. The often-used composite indices developed by UNDP, GDI and GEM, suffer from conceptual and methodological weaknesses which are analysed in this paper. The paper then goes on to develop an alternative composite measure of gender equality. Finally, some first attempts are made to examine the relationship with economic development.

1. INTRODUCTION

The relationship between gender equality and economic development has often been a topic for debate. A first question is whether economic development improves the position of women. Many feminist social scientists are sceptical about this. They argue that economic development may improve the situation of women in some respects, but that it brings new inequalities at the same time. For example, an increased labour market participation of women is accompanied by new subordination in the working place and/or by a double burden (see Benería and Feldman 1992). The extensive literature on the impact of structural adjustment programs on women often concludes on a worsening position of women (Afshar and Dennis 1992, Sparr 1994). However, these studies are often based on limited data and weak methodological designs. Data for *before* adjustment are often not available, and even if they are it is difficult to assess the counterfactual: what would have happened in the absence of adjustment. The concept "feminisation of poverty" also implies a worsening of the position of women, but its empirical justification is often weak.

Other studies take a longer timeframe into account, but they focus on just one aspect of gender inequality. In both cross-section analysis and in a longitudinal study for the USA, Goldin (1994) finds a U-shaped relationship between economic development and gender equality. However, her definition of "gender equality" is limited to female labour market participation. Norris (1992) develops a model showing that gender inequality increases over time, but she includes only labour market variables in her definition of inequality.

A question that has been asked more recently, is whether gender equality leads to a better macroeconomic performance, as measured, for example, in a higher Gross Domestic Product (GDP). Is the gender *distribution* of the pie relevant for its size? Or, in other words, does it matter who *makes* the pie and who *eats* it? The answer of mainstream economists is that it does not. The total size of the pie is maximised if all resources are used where their productivity is largest. A market economy will automatically provide this maximum. However, this concept of allocative efficiency is based on a given distribution of resources. This static theory is not very helpful when analysing a relationship with economic development. The question then is to what extent another distribution of resources leads to higher output. This paper draws on insights from feminist macroeconomics, among other theories, to conclude that gender equality does

make a difference for growth.

However, the examples mentioned above show that there is a need for a better empirical indicator of gender equality, which is not only based on labour market participation. In order to use it for assessing the relationship with economic performance, this indicator should measure gender equality as such, and should not include some assessment of absolute levels of development. Another requirement for a new indicator for gender equality is that it can be used for comparisons over time and across countries.

This paper aims to develop such a measure of gender equality and to examine the relationship of this "Standardised Index of Gender Equality" with economic development. The next section examines the theoretical basis for assuming that more gender equality leads to better macroeconomic performance. This analysis also provides clues for the dimensions that have to be included in a measure of gender equality. We then continue by examining the two measures developed by UNDP in its *Human Development Report* 1995, the Gender-related Development Index (GDI) and the Gender Empowerment Measure (GEM), showing why they are not appropriate for our purposes. After this, we develop our own "Standardised Index of Gender Equality" (SIGE), analyse the results, and relate this index to economic development. The last section concludes.

2. GENDER EQUALITY AND ECONOMIC PERFORMANCE

The total size of the pie is at its maximum if all resources are used where they have the highest productivity, or when marginal productivity of all resources is equal. This leads to maximum for allocative efficiency. The assumptions for this criterion of “Pareto optimality” - also formulated as no one can be made better off without another person being made worse-off - include perfect competition and the absence of externalities. But this criterion also abstracts from the distribution of assets, and it takes a person's preferences as given.

In fact, the distribution of resources over women and men (assets such as education, employment) is determined by institutions, rules, laws and power relations and by ideas on what is feminine and masculine. This given distribution will then set the stage for the current allocation of resources, and may hamper women to fully develop their potential. Preferences may also be less "autonomous" than would appear at first

sight (Bruyn-Hundt and Kuiper 1994, Seiz 1992, Woolley 1993). They are influenced by culture but also by the practical barriers which women, in particular, face to "exit" a given subordinate position. Several authors have pointed to the inconsistency of assumptions underlying economic theories: individuals behave perfectly rational and seek self-interest in the market, while behaving completely altruistic in the household (Ferber and Nelson 1993, Folbre 1994). While economists tend to think that individuals choose, sociologists often stress that there is no choice at all. A realistic social science will have to recognise that there are elements of "agency" and of "constraint" in all behaviour. As Folbre put it, it is important to examine the "structures of constraint" (Folbre 1994). In her view, these structures of constraint follow from assets, rules, norms and preferences.

The emerging feminist macroeconomics (see Bakker 1994, Cagatay *et al.* 1995, Elson 1995) has drawn attention to the existence of gender bias in macroeconomic analysis. The gender bias not only results in less equal outcomes for men and women, but may also reduce the effectiveness of macroeconomic policies themselves. This is because most macroeconomic analysis does not take into account the different positions of men and women in the economy. For this reason, thinking along gender lines is necessary in order to improve our understanding of macroeconomic phenomena. The different positions of men and women are, in particular, visible at three levels (Elson 1995):

1. The labour market;
2. Unpaid work;
3. The distribution of income and other assets within households.

These levels can be applied to a general analysis of the impact of gender inequality on macroeconomic performance. We examine these levels in turn, in order to assess whether the size of the pie may be affected by its distribution, and what aspects of gender inequality are responsible for it.

2.1 The labour market

Women and men occupy different positions in the labour market. There is both horizontal and vertical sex segregation on the labour market: women and men are in different occupations. In general, men occupy the higher labour market positions. In addition, women's wages are lower than men's wages everywhere (they constitute about

70%); they are also lower if corrected for education and experience (Bartels and De Groot 1997). If this difference would be fully due to biological differences, there would be nothing to worry about for economists. If it is due to other factors, however, it means that another allocation of men and women over labour market positions would produce higher output.

Evidence is piling up that other factors *are* important. First, the gender typing of occupations is not equal in different cultures and is changing over time. While until recently medical doctor was a male job in the Netherlands, it was a female job in the Soviet Union and is a mixed job in the Netherlands now (although some medical occupations are -still- predominantly carried out by men). This shows that cultural factors are important, as well as opportunities and constraints for women to study and to carry out this occupation. In some cultures, farming is seen as a male job (Northern India) while in others, most farming activities are carried out by women (many African countries). Laws and regulations also inhibit women to participate on the labour market. In Afghanistan women are prohibited to perform a job outside the house, and not so long ago married women were fired from government service in the Netherlands. In many parts of the world, women have less access to education. In others, where education levels are equal, studies show that explicit and implicit rules and norms inhibit women to break the "glass ceiling" to higher management positions (Moss Kanter 1993). In sum, the allocation of men and women over different labour market positions is not the result of different capacities only, but also to other factors. If so, then the allocation is suboptimal and can be expected to lower macroeconomic outcomes.

It seems to be a combination of culture, rules, access to other assets such as education, and power that causes the lower labour market position of women. Thus, this combination of factors is responsible for a suboptimal allocation of production factors, in this case, female and male labour. The allocative efficiency of the economy can be improved if women have equal access to education, and if more jobs are allocated according to capabilities and not according to customs, rules or cultural ideas regarding masculine and feminine jobs. Apart from this one-time improvement in allocative efficiency leading to a once-and-for-all increase in GDP, one can also hypothesise that dynamic efficiency of the economy will improve. A permanently higher growth rate could be the result of the beneficial effect of having "mixed teams" at all levels in labour organisations (Van Witteloostuin 1994).

2.2 Unpaid work

In all societies women do more unpaid work in households than men do, and men participate more in the paid labour market (UNDP 1995). Becker (1981) was the first economist to analyse this division of paid and unpaid work. He explains it from the different ratio of the marginal market wage rate and the marginal productivity of household production for a man and for a woman. As long as this ratio is larger for the man, a couple benefits from specialisation. This model has been criticised by feminist economists for being too static. Once the couple has chosen for some specialisation, this division of work reinforces the differences in productivity thus lowering the wife's threatpoint. Such a threatpoint is determined by the concrete possibility to exit (Gustafsson 1997, Ott 1992). In industrialised countries the possibility to exit generally exists, but women have to take lower income levels into account after divorce. In other societies, women can only exit at the cost of losing their children, seclusion, or serious injuries.

One can add that a given productivity ratio is often the result of different socialisation of boys and girls and, in many countries, from different education levels. In sum, the full or partial specialisation of women in household work cannot be explained by their relative inherent capabilities for it. This division is to a large extent a consequence of the different socialisation of boys and girls (culture), different education levels, and in many societies it is also a matter of institutionalised power.

Even if both partners work the same number of hours in the market, women usually work more hours in housekeeping and childcare. Data for the Netherlands show that this still holds for families with young children. Hochschild (1989), doing research in the 1980s in the USA, found that women continue to do the unpaid work in households even if their male partners are unemployed and the women themselves have a full-time job. She found that this was due to the husband's loss of self-esteem as a result of their inability to provide for their families due to their unemployment. Engaging in housekeeping activities would further affect their sense of masculinity. This division of labour clearly was not efficient and did not enhance the well being of the family. Women became overworked and men had too much leisure – but they did not enjoy it and instead became more and more depressed. In other studies, men proved to increase their household activities when being unemployed (Wheelock 1990). These two examples make clear that the division of labour over paid and unpaid work is not biologically given; it can change as a result of economic circumstances, but this change is also con-

tingent upon cultural factors. Allocative efficiency can be improved if the division of paid and unpaid work is based on relative capabilities. Dynamic efficiency effects can also be expected, since we can hypothesise that a larger contribution of men to household and caring activities will improve the quality of these services: children, in particular, will benefit from having more and better contact with their fathers.

2.3 The distribution of income and other assets within the household

The household is the locus for the distribution of several important assets, such as food, clothing, love and care, education and access to formal education, informal health care and access to formal health care, income, leisure and sleep. In economic theory the household was long taken as a unit, implicitly assuming that there was an equal distribution within it. More and more evidence is available to show that this is not the case. The household proves to be a place of violence, discrimination and neglect. Women and children are particularly vulnerable. For some poor societies it has been shown that girls are substantially more undernourished than boys (Miller 1981, Sen and Sengupta 1983). In several countries the sex ratio is negative for women and this can only be explained from sex-specific abortion and infanticide, and from giving girl-babies less food and medical services than boy-babies.

In many societies, girls have less access to education and health care than boys do. Not much is known about the distribution of income within households, but in many societies (Latin America, Asia) there is evidence that men consume part of their income for their own consumption and leisure activities, before spending it for basic necessities of their families. If women have access to earnings, they tend to spend all on basic necessities for the family. In Africa, the concept of "household income" does not seem to be relevant at all: women and men have their own income and expenditure responsibilities within the household (Dwyer and Bruce 1988).

In almost all countries, women work longer hours than men do if both paid and unpaid work is taken into account (UNDP 1995). In poor societies the difference seems to be even larger. Poor women with young children reduce sleeping hours to a bare minimum and do not have any leisure. This means that in almost all countries, men enjoy more leisure and sleep than women do.

It is unlikely that this division of leisure and sleep is always determined by efficiency motives. Nor does there appear to be an economic reason for giving less food to

women and girls. It seems that the distribution of consumption, health and education, and time, is the result of power relations in the household, but also of norms, rules and culture. Gains at the macro-level can be expected from a better distribution of assets within the household between girls and boys, and between women and men. A better distribution of time for leisure and sleep, and also of food between men and women will lead to immediate gains in the performance of women. At the macroeconomic level, these gains will outweigh eventual negative effects on the performance of men, resulting in a higher GDP. Assuming that there are no differences given by nature in the "level" of the economic contributions of women and men to society, this net positive effect comes about. This can be called an allocative efficiency effect. A better distribution of assets (food, education, etc.) over girls and boys also implies a better allocation of investment in human capital. This will improve women's market performance in the future and these gains can be called dynamic efficiency effects.

2.4 Conclusion

From this overview of the three levels at which gender inequalities manifest themselves in the economy, we can draw two conclusions. First, existing gender inequalities in the labour market, in the division of unpaid work and in the distribution of assets within the household, have consequences for allocative efficiency of the economy, and probably also for dynamic efficiency (see Table 1 for an overview). Who makes the pie, and who eats it *does* make a difference for the size of the pie. A better allocation of labour market positions and of unpaid work, and a better distribution of assets within households will lead to a once and for all increase in GDP, and probably also to higher growth rates.

Table 1. Gender inequalities reduce economic performance

Error! Bookmark not defined.	Allocative efficiency	Dynamic efficiency
Labour market	Suboptimal allocation of female and male labour	Organisation theory: mixed teams better
Unpaid work	Suboptimal division of paid and unpaid work	Quality of raising children improves
Distribution within households	Suboptimal distribution of leisure and sleep, and other assets over women and men	Suboptimal distribution of assets over girls and boys reduces human capital

Secondly, the fact that gender inequalities have economic consequences does not imply that gender inequality can be *equalised* with inequality in economic factors such as access to (economic and other) assets. The above analysis points to power, including institutionalised power in laws and regulations, and cultural norms and values, as important aspects of gender inequality. In order to measure gender equality it is thus necessary to include these other dimensions such as power and culture as well.

3. UNDP'S MEASURES OF GENDER EQUALITY

In its *Human Development Report 1995*, UNDP has presented two measures of gender equality (UNDP 1995): the Gender-related Development Index (GDI) and the Gender Empowerment Measure (GEM). This pioneering work has been important in raising attention for gender inequality in international policy debates, as well as in raising attention among academics for the issue of measuring gender inequality. The index presented in this paper has also been inspired by these UNDP measures and draws on the good aspects of it, trying to avoid the problematic aspects. It is therefore important to state what GDI and GEM are and why they do not serve our purposes.

The most important reason is that both GDI and GEM do not measure gender inequality *as such,* but some combination of absolute levels of attainment and relative female attainments. This limitation of the GDI has been recognised before (Bardhan and Klasen 1999, Dijkstra and Hanmer 2000, White 1997). As White correctly states, UNDP (1995) is wrong in drawing comparative conclusions on gender equality on the basis of the countries' GDI scores. As I will show below, this same criticism also holds for the GEM. Secondly, questions have been asked about the *choice of indicators* in both GDI and GEM (Bardhan and Klasen 1999, Dijkstra and Hanmer 2000, Wieringa 1997b). And thirdly, there are problems with the *construction* of the indices. Bardhan and Klasen (1999) have brought these forward, in particular for the GDI. The GEM received much less attention in this respect. Table 2 summarises the methodologies of GDI and GEM. In the following, I deal first with the choice of indicators, then with the limitations of GDI and GEM for measuring gender equality as such and with other methodological problems involved in indexing and averaging the female and male scores on the indicators, and finally with problems involved in the construction of the composite indices.

The GDI uses the same indicators as the earlier introduced Human Development

Index (HDI, see UNDP 1990), namely income, life expectancy and education. Income per capita is here "adjusted" as in the HDI, since it is assumed that above a certain level, more income does not increase basic human development. With respect to the choice of variables for the GDI, most criticism has been raised against the income variable (see Bardhan and Klasen 1999, Dijkstra and Hanmer 2000). This indicator is based on the female share in the economically active population and on the relative female/male urban wage rate. Definitions of economically active population vary, however. In particular, work in family enterprises and in subsistence activities is sometimes included and sometimes it is not, and this makes a large difference for the outcome. Rural wages and most informal sector wages are not included, while urban wage rates by sex were only available for 55 countries. A weighted average of the relative female/male wage ratio found in these 55 countries (which proved to be 75%) has been used for the other 130 countries. This implies that for most countries, the 75% wage differential is simply assumed. A final major point of critique against this indicator is that the actual distribution of income within households is not taken into account. But in practice, it is still very difficult to include this distribution given the data limitations.

Much less criticisms has been raised against the other two indicators in the GDI, life expectancy and education, the latter as a combination of literacy rates and combined primary and secondary enrolment rates. However, a problem with the data on life expectancy is that they do not include the “missing women”. Comparing the sex ratios for different countries, it turns out that in some countries, especially in China, Bangladesh, India and Pakistan, the actual ratio between women and men is much lower than the expected ratio (Bardhan and Klasen 1999: 990). In these countries, girl babies are often much less desired than boys, leading to sex-specific abortions or the neglect of female babies. Although the latter should be reflected in life expectancy ratios, there will often be deficient reporting of infant mortality. Life expectancy rates will in general not account for these sex-specific “health risks”.

The GEM is meant to be a measure of female economic and political power. Critics have pointed to the limited relevance of using the share in parliamentary seats (Bardhan and Klasen 1999, Wieringa 1997b). In socialist countries this share tends to be high, but parliaments have only limited power. It has been recommended to look at female representation in local governance bodies, and to other indicators of female power such as the strength of women's organisations and the way women's interests are

promoted. However, data on female representation at lower levels are not systematically available and there are conceptual and measurement problems involved in using other indicators. The second variable used in the GEM is the female share in professional and technical, and administrative and managerial positions. This indicator has not met significant criticism thus far. While the female share in parliament may fluctuate according to the particular year in which it was measured (depending on electoral cycle), the female share in these occupations is less sensitive for year of measurement. The third indicator in the GEM is the female share in earned income. The computation of this income share is done in the same way as for the GDI, so that the same criticisms hold.

3.1 From variable to indicator: methodology

With respect to the methodology in dealing with female and male scores on the different indicators, the general principle of the GDI is that it begins with the overall scores and then subtracts for gender inequality, assuming that countries have a certain degree of "inequality aversion". This inequality aversion factor ε (epsilon) is set at 2, which implies that the harmonic mean is taken from the female and male achievements; this mean is then weighted with female and male shares in population (for details see UNDP 1995, Anand and Sen 1995, Dijkstra and Hanmer 2000). As long as there is disparity between female and male scores, the harmonic mean is lower than the arithmetic mean since the lowest score weighs more heavily in it.

Table 2. Methodology for GDI and GEM

Measure	Indicators	Step 1 (indexation for GDI; penalty for inequality for two GEM indicators)	Step 2 (Penalty for inequality for GDI and one GEM indicator; indexation for other GEM indicators)	Overall index
GDI	Life expectancy	Women live 5 years longer; Index 0-100	Harmonic mean of population-weighted female and male scores	Simple (arithmetic) average of three scores
	Adult literacy Combined enrolment, together: education	Index 0-100 Index 0-100 1/3 enrolment plus 2/3 literacy	Harmonic mean of population-weighted female and male scores	
	Share in adjusted income, %	Female share in EAP times female wage/average wage divided by share in population (= proportional income shares)	Harmonic mean of population-weighted proportional income shares; Times adjusted income p.c.; (min=100, max=6,311)	
GEM	Share in parliament, %	Harmonic mean of population-weighted shares	Indexed 0-100 by multiplying by 2	Simple (arithmetic) average of three scores
	Share in professional and technical, %; and share in management and administrative positions, %	Harmonic mean of population-weighted share; harmonic mean of population-weighted share	Indexed 0-100 by multiplying by 2; Indexed 0-100 by multiplying by 2; Simple average of the two	
	Share in unadjusted income, %	Female share in EAP times female wage/average wage (non-agricultural wages); divided by share in population (= proportional income shares)	Harmonic mean of population-weighted proportional income shares; Times unadjusted income p.c.; Indexed 0-100 (min=100, max=40,000)	

For income the computation is a bit different. The female (male) share in total income is divided by share in population to get "proportional income shares" (Table 2). The harmonic mean of these proportional income shares is then computed. Strangely enough, in computing this harmonic mean the income shares are again weighted with shares in population. This is redundant, since shares in earned income have already been divided by population share. The harmonic mean is then multiplied by adjusted income per capita. As in the HDI, "adjusted" income means that per capita levels above average income are discounted.

According to Bardhan and Klasen (1999:993), this means that gender disparities in income shares have larger consequences at higher income levels than at lower income levels. Although it is technically true that the gender differences are penalised more at middle income levels than at lower income levels[1] this is a consequence of the fact that the absolute income level weighs heavily in the GDI score. It is very difficult for poor countries to outperform rich countries on the GDI, no matter how equal they distribute their income. As long as there is a gender gap, the GDI will be lower than the HDI. The procedure of multiplying with adjusted income is simply the consequence of the wish to have a measure that reflects absolute levels of human development as well as gender inequality. However, this critique from Bardhan and Klasen becomes relevant if attention is not focused on the GDI itself, but on some measure of difference between GDI and HDI (as in some of the proposed alternatives, see below). The final step for the income component is that the outcome is indexed to obtain a value between 0 and 100 (see Table 2).

For the GEM, all three indicators or variables involve female shares in a total (parliamentary seats, occupations, and income, see Table 2). Theoretically, this could have led to a simple and direct measure of gender inequality: multiplying the female share by 2 would give a score on a scale from 0 to 100. However, in order to be "consistent with the methodology applied in the GDI" (UNDP 1995: 132), UNDP opted for the use of population-weighted harmonic means again, to get "Equally Distributed Equivalent Percentages" (EDEPs). These EDEPs are then multiplied by 2 to get a score between 0 and 100. Taking the harmonic mean again means that the GEM is *not a direct measure of gender equality either*: the harmonic mean of female and male shares is higher than the female share, and thus softens the inequality. While in the GDI this can be justified by arguing that absolute levels of well being also matter, there is no such

justification for dealing with female share in parliament or in higher occupations.

Another problem is the way income is treated in the GEM. Unlike for the other variables of the GEM, the population-weighted harmonic mean is not taken from the shares themselves, but instead from the "proportional income shares" (income share times share in population) – as in the GDI. Apart from the fact that this again implies double weighing for population share (as in GDI, see above), this difference in procedures with the other variables of the GEM, is strange. Furthermore, the next step involves multiplying this mean with *unadjusted* income per capita. UNDP's motivation for taking unadjusted income is that income in the GEM is valued as a source of power and not for its contribution to basic development (UNDP 1995: 82). However, as a result of this multiplying with absolute levels of income per capita, this absolute income level has a very large impact on the total score of the GEM. The GEM has become an odd combination of, on the one hand, two variables where *relative* female power is counted – albeit softened by their harmonic means, and on the other, one variable in which the absolute income level per capita weighs heavily. Thus far, these problematic issues of the GEM have been neglected in the discussion.

An additional problem is that the methodology used for both GDI and GEM of taking the harmonic mean of the two scores, punishes for inequality *no matter whether female scores are lower or higher than male scores.* As a result, a country where women do better with respect to longevity and education has a lower score (all other things being equal) than a country where women and men have equal scores for these two variables. This happens to be the case of Norway, the country used as example in the 1997 *Human Development Report* to explain the methodology for the GDI. In other words, countries where women do better than men on some indicators cannot compensate for other inequalities but are additionally punished.

3.2 The composite index

The third type of weakness of GDI and GEM lies in the construction of the final indices. In both GDI and GEM a simple arithmetic average is taken of the scores for the three indicators. It is argued that there are no reasons for the weights of the variables to be different. However, the variances of the three indicators differ widely and this implies that the indicator with the largest variance has the strongest weight in the overall index (Harvey *et al.* 1990, Perrons 1995, Sugarman and Strauss 1988). For the GDI, the

income variable has a much larger spread than the other two variables. Bardhan and Klasen (1999) computed the implied penalties for inequality for the three indicators of the GDI, showing that the gap in income accounts for 85% of the total gender gap, on average. This problem - that the overall index is dominated by one of the three components - is less severe for the GEM, since the variances of the three components do not differ as much as in the GDI.

3.3 Conclusion

In sum, the main criticism to GDI and GEM is that they do not measure gender inequality as such. They combine measures of absolute well being or income with some measure of inequality. Therefore, neither GDI nor GEM can be used to analyse the relationship between gender equality and economic performance. In addition, there are other problems with the way GDI and GEM are constructed, with the choice of indicators and the way these indicators are dealt with before they enter as components in the overall index. In developing an alternative index for gender equality, not so much can be improved in the choice of indicators since data availability is limited. However, it can be attempted to avoid the methodological problems.

Several alternative indices have been developed so far, in particular for the GDI. White's GEQ (Gender Equality index) is defined as the ratio of GDI and HDI (White 1997). Forsythe *et al.* (1998) focus on gender inequality (GI) which they define as (HDI-GDI)/HDI. These indices are similar and *do* measure equality, respectively inequality (see also Anand and Sen 1995, UNDP 1995: 126, 129). However, they still suffer from the other limitations of the GDI, in particular, the peculiar way the income variable is defined and measured, and the fact that the variation in the overall index is dominated by the variation in relative income share. Dijkstra and Hanmer (2000) developed a relative gender equality index (Relative Status of Women, RSW) by taking the same variables as the GDI but using relative achievements in the three areas. Although this is a more direct measure than the GEQ or the GI, the other criticisms still hold. Former socialist countries do well on this index since female labour market participation is high and this variable dominates the overall index. GEQ, GI and RSW only include variables related to human development, and exclude the power dimension that is measured in the GEM.

Bardhan and Klasen (1999) have computed a revised GDI. Their GDI attempts

to solve the *de facto* unequal weighting of the three components, in two ways: First, they limited the maxima and minima against which actual achievements in life expectancy and education are related to actual minima and maxima over all observations, thus broadening the range of possible achievements. Secondly, they used different "inequality aversion" factors epsilon for the different components, with the lowest epsilon for the income component and the highest for life expectancy (respectively 1.5, 3 and 6). Although this is an improvement of the GDI, this measure still compounds absolute levels of human development with relative female-male achievements.[2]

Apodaca (1998) develops an index composed of seven indicators that measure women's relative economic and social rights. However, some of the indicators she uses are problematic, and she does not solve the problem of the implicit unequal weights. This is what we will do now.

4. TOWARDS A STANDARDISED INDEX OF GENDER EQUALITY (SIGE)

Ideally, a new measure of gender equality should meet the following requirements:

1. It should be a relative measure, that is, it should measure gender (in)equality and not some combination of absolute well-being and inequality;
2. Data should be available for many countries, should be internationally comparable and as reliable as possible;
3. The index should comprise of a number of indicators that, taken together, represent all relevant dimensions of gender equality;
4. The construction of the overall index should be such that there is no unintended weighing of some factors more heavily than other factors.

It is not possible to satisfy all requirements to the same extent. The requirement that indicators should measure gender (in) equality implies that indicators for absolute well being of women, such as maternal mortality rates, are excluded. Only indicators for which we have gendered statistics qualify for the index.

Data availability is an important constraint, and even if data are available, they are not always reliable. The database we use is the Women's Statistics Database (WISTAT) as developed by the UN and available on CD-ROM. The sources for these data include internationally available statistics such as the International Demographic

and Health Surveys and the Yearbooks of International Labour Market Statistics of the ILO. For some data, WISTAT used national surveys, if available. I used the data from the 1994 series, which was the latest series available in WISTAT, but in practice data were often from (around) 1990. This means the information is not very recent. For example, data for former socialist countries reflects the situation of these countries when they were still subject to central planning. Our index can only be considered an illustration of what is possible on the basis of available statistics. It should not give rise to conclusions on the current state of gender equality in the different countries.

Furthermore, our knowledge of what the relevant dimensions of gender equality are, and how these dimensions can be measured, is limited. This holds, in particular, for measuring gender equality in international perspective.

Possible dimensions of gender equality that can be used in cross-country comparisons were discussed in a Workshop held at the Institute of Social Studies in The Hague, in which researchers from Bhutan, Benin, Costa Rica and the Netherlands participated.[3] The aim was to define important aspects of gender equality and inequality that may hold in different cultures. The following eight dimensions were identified (Wieringa 1997a):

1. Gender identity, which includes cultural issues such as the socialisation of girls and boys, the rigidity of the sexual division of labour;
2. Autonomy of the body, which refers to the absence of gender-based violence, control over sexuality, and control over reproduction;
3. Autonomy within the household. This encompasses the freedom to marry and divorce, right to custody in case of divorce, and decision-making power and access to assets within the household;
4. Political power, which includes decision-making at above-household levels such as municipalities, unions, government, and parliament;
5. Social resources, which refers to the access to health and education
6. Material resources, which refers to access to land, houses, and credit
7. Employment and income; this dimension is about the distribution of paid and unpaid work, wage differentials, formal and informal labour;
8. Time; this is a separate indicator, and includes the relative access to leisure and sleep.

There is some overlap between these dimensions and the factors mentioned in

the brief theoretical and empirical discussion above. Section 2 concluded that access to assets is important, as well as power and culture. With respect to access to assets, a distinction can be made between social and economic assets. These four factors (culture, power, and social and economic assets) are loosely related to the eight dimensions as defined in the Workshop. Culture is most closely related to gender identity, but is also of influence on all other dimensions. Power is also a factor that plays a role in all eight dimensions, but it is most explicitly related to dimension 4. Dimension 5 of the Workshop is social resources and dimensions 6 and 7 deal with access to economic resources. Time, in so far as it is access to leisure and sleep, is a social resource, but it is also an economic resource.

Unfortunately, it is not possible to use internationally available data for all dimensions as identified in the Workshop. It is particularly difficult to find data for gender identity, or more generally, for the cultural factor. However, we can expect cultural factors to be of influence on many gendered statistics that *are* available. For example, women's culture will be of influence on women's access to education, as well as on their relative position the labour market and in parliaments. For autonomy of the body no internationally available statistics are available either. Another dimension, for which no data are available yet on a sufficient scale, is time use. In OECD countries, time use data is generally registered. UNDP (1995) published data for gendered time use for eight former socialist countries and nine developing countries, but in total this gives data only for 31 countries.

It is important to include several different aspects or dimensions of gender equality in our index. All participants in the discussion considered the above-mentioned eight dimensions important, but it was clear that some of them were more important in some countries than in others. In some countries, for example, there is no difference in access to education for boys and girls, while women and men still hold unequal positions in the labour market. Similarly, in some countries women have access to the labour market but at the cost of having much less time for leisure and sleep, or vice versa: women have more leisure than men but do not earn their own incomes. This shows that *the different dimensions of gender equality may move together, but not necessarily so*.

This fact constitutes a constraint for the construction of an Index, or scale. We cannot construct it on an empirical basis by looking at internal consistency of the scale. When an index is constructed of labour market inequality, for example, the different

indicators are expected to have a high correlation with each other (see Sugarman and Straus 1988). The Cronbach alpha can be computed, and those indicators with a too low correlation with the other indicators and with the overall index are removed from the index. In our case, however, we cannot conclude from the presence or absence of a relationship with other indicators, on the validity of inclusion of the indicator in the overall index.

4.1 The choice of indicators

In the following, I examine a set of variables for which data are readily available, analysing what dimension of gender equality they represent and how well they represent it. These variables are given an operational definition by assigning indicators to them. The choice closely follows the indicators used by UNDP for constructing GDI and GEM, albeit that the way they enter the index is different. The following five variables are examined:

1. Relative female/male access to education
2. Relative female/male longevity (life expectancy)
3. Relative female/male labour market participation
4. Female share in administrative and management positions
5. Female share in parliament.

1. Access to education. Relative access to education is perhaps the most important and most universal indicator for gender equality. It is one of the components of dimension 5, access to social resources. But there is also a relationship with access to economic resources: the higher the education levels, the more chances women have to improve employment status and income. Furthermore, higher relative education can be expected to also increase women's autonomy in the household and women's power at above household levels. Finally, a relation with culture can be assumed: if women and girls have more access to education this reflects cultural changes in society, and it will in turn allow more cultural changes in favour of women to come about.

We use figures on the relative female/male ratio of combined primary and secondary school enrolment and of literacy rates, giving literacy a weight of 2/3 and combined enrolment of 1/3, just as UNDP has done for the GDI (UNDP, 1995). Although this indicator is relatively undisputed, some criticism can be raised, in particular to the

use of school enrolment ratios. These ratios say relatively little on school attendance and performance. In addition, school enrolment may be high if there is a lot of repetition: if many relatively old children are enrolled, enrolment rates are raised artificially since the denominator is based on a certain age cohort. However, since enrolment rates only constitute 1/3 of this indicator, this problem is not considered to be very serious.

2. Relative access to health. The relative health situation of women can be captured by relative figures on female/male life expectancy. This indicator reflects eventual discrimination in access to health services (dimension 5), and through this, it may reflect cultural ideas on women and men. But it also measures to some extent women's relative access to leisure and sleep, since more sleep and more leisure will generally foster a longer and healthier life. Since no direct data on access to leisure and sleep (dimension 8) are available for a sufficient number of countries, this is an advantage.

UNDP (1995) also uses relative life expectancy figures in the GDI, but corrects them for the fact that women live, on average, five years longer than men. Since our data are transformed and standardised before they enter the overall index (see below), we do not need to apply any correction: the higher the relative female/male life expectancy is, the better the relative health situation of women is.

3. Relative female/male labour market participation. This can be measured by the ratio of the female economic activity rate and the male economic activity rate. Participation in the labour market is generally considered a sign of female emancipation. It usually provides women with an independent income, and many jobs give women access to some power. Labour market participation is also assumed to foster women's relative autonomy in the household. However, these positive consequences depend on the *kind* of integration in the labour market.

Unfortunately, the definitions on "economically active population" vary by country and sometimes by region within countries. In some countries/regions, unpaid family labour and work in the subsistence economy are included, in others they are not. For example, the relative female/male labour market participation is 18 in Mali and 56 in Togo – both West African countries between which we do not expect relative female labour market participation to differ very much. The large difference must therefore be due to different operational definitions. Bardhan and Klasen (1999) report large differences even between Indian states. Obviously, unpaid family labour does not give women an independent income, nor does it lead to more autonomy in the household.

Another problem with this indicator is that a high relative female labour market participation may imply a double burden for women. If women's household and caring tasks are not shared with men, the positive effect of labour market participation is offset by a negative effect on women's access to leisure and sleep, and so on women's well-being and health. For our index, however, this is not so much a problem as long as we include the indicator for relative health.

The income dimension is only captured to a limited extent by this indicator. We could have multiplied this ratio by relative female/male wages, as UNDP does for the GDI, but for most countries these data are not available. Taking an average of 75% for all these countries, as UNDP does, is not useful in our context since values will be standardised later on (see below), and multiplying all values by a constant does not change standardised outcomes.

4. Female share in technical and professional and in administrative and management positions. This indicator is used by UNDP as part of the GEM. It is a measure of access to economic assets, since these jobs are relatively better paid than many other jobs. Access to administrative and management positions reflects to some extent decision making power in society, while access to technical and professional occupations reflects opportunities for career development (UNDP 1995). At the same time, this indicator is also an approximation relative female participation in the *formal* labour market (as opposed to labour market participation in general which may be in unpaid family labour), albeit that not all sectors are represented.

This indicator is much less sensitive to statistical conventions than the former on relative labour market participation. It also says something on relative female power. The higher the share of women in these positions, the more power women have in society relative to men. Women in these formal labour market positions will also have more power and autonomy in the household. In addition, this indicator reflects aspects of culture. And in comparison to the female share in parliament (see below), it is much less sensitive to the particular year in which it is registered.

5. Female share in parliament. This is an obvious indicator for relative female power in society. However, the limitations of this indicator are well-known and have been pointed out above: it only includes female power at national level, in some countries parliaments have little power, it is only about formal power, and the figure is sensitive to the particular year in which it is measured. Nevertheless, it seems to be an im-

portant indicator for relative female power. One can assume that there is also a relationship between this indicator and cultural factors, as well as with autonomy in the household. Women cannot be members of parliament if they are not allowed to "go out" by their husbands or fathers. The main advantage of this indicator is that data are available for many countries.

4.2 The composite index

For the decision on which of these five indicators to include in the composite index, we cannot rely on an empirical analysis (see above). From the analysis above, it seems a good choice to include all five indicators: there are two variables for access to social assets, two variables for the labour market, and one for relative power in society. Although all have their weaknesses, the combination of the five and giving them equal weight can be expected to minimise distortions.

In order to combine these indicators in one index, some elaboration of the raw data is necessary. All five are *relative* indicators: female achievements divided by male achievements, or female shares. In order to avoid the unintended overweighing of one indicator above others, it is necessary to standardise the raw data. For the construction of the overall index, we have standardised the initial scores, so we expressed them as number of standard deviations from the mean of the series, as follows:

$$z_{ij} = (x_{ij} - \mu_j) / \sigma_j$$

Where:

x_{ij} = score of country i on indicator j, j = 1..5

μ_j = arithmetic mean of scores of all countries on indicator j

σ_j = standard deviation of scores of all countries on indicator j

However, mean and standard deviation cannot be meaningfully used if the distribution is not approximately normal. For this reason, some series had to be transformed.[4] The standardisation has been applied to the transformed scores. Finally, a Standardised Index of Gender Equality (SIGE) was computed by taking a simple arithmetic mean of the standardised and sometimes first transformed, scores on the indicators. The index Z_i for each country *i* is therefore:

$$Z_i = \{\sum_{j=1}^{n} z_{ij}\} / 5$$

See Table 3 for overview of computation of this score. The disadvantage of this overall index is that the score does not have an intuitive meaning. Figures run from small negative to small positive numbers, with an average close to zero.

Table 3. Standardised Index of Gender Equality (SIGE)

Variable	Indicator
1. Relative access to education	2/3 relative literacy rates, 1/3 relative combined enrolment rate; Simple weighted average of the two
2. Relative access to health	Female life expectancy /male life expectancy
3. Relative labour market participation	Female activity rate/male activity rate
4. Female share in technical and professional, and in administrative and management positions	Sum of numbers of women in these occupations/total number of persons in these occupations
5. Female share in parliament	Number of female members/ total members of parliament

5. RESULTS AND FURTHER ANALYSIS

The Appendix Table shows the results of we combine these five indicators in one index, the Standardised Index for Gender Equality (SIGE). The index could be computed for 115 countries. Finland comes on top, followed by Sweden and Denmark. The Table also shows the original scores for each of the five indicators, and the rank of each country in each indicator (in italic).

Finland has high ranks for all five indicators, and scores best n female representation in parliament. Sweden owes its high score to the high female share in professional, technical, administrative and management positions (STPAM), but also scores well on parliamentary representation (SPAR). Apart from several other industrialised countries (Norway, Canada, Austria), some former socialist countries also do well on this Index (Poland, Hungary, Bulgaria). The Appendix Table shows that this is not so much due to their score on female share in parliament, as would be expected, but more

to the high scores on the two labour market variables: relative female labour market participation (REAP) and STPAM. Poland also has a high score on relative life expectancy for women (RLEXP).

Some Caribbean countries can also be found relatively high: Jamaica (7), Barbados (11), Guyana (12), Suriname (20), Cuba (21), and Trinidad and Tobago. These countries score well on labour market participation, with the exception of Guyana, which owes its relatively high score to high female parliamentary representation. Nicaragua is the highest Latin American country (at 15), probably due to the socialist policies in the 1980s that improved women's relative access to social resources. El Salvador is in the 25th position. In the ranks between 34 and 82 we find all other Latin American and Caribbean countries. The Philippines is the Asian country with the highest rank (24), followed by Thailand (30) and China (43). Most Asian countries are in much lower ranks, however. Predominantly Muslim countries Bangladesh, Afghanistan and Pakistan close the list. The highest African country is the relatively rich Botswana (at 33), and Swaziland (37) and Lesotho (38) follow this country. Rwanda is also just within the first 50, due to its high rank (1st) on relative female labour market participation (REAP). Most Sub-Saharan African countries can be found between ranks 50 and 100, however, while most North African countries can be found between 103 and 112.

Surprisingly, the empirical results for the much criticised indicator female share in parliament do not seem to deviate much from what one would expect *a priori*. In all countries the share of women in parliament is low, but it is relatively higher in western countries where one would expect values that accept women in higher positions to have changed most. Finland scores highest, while Norway, Sweden, Denmark and the Netherlands are in places 3-6. One exception to this rule is Guyana that ranks 2d on this variable. The "former socialist country effect" does seem to hold, however, for Cuba (7th) and China (9th).

El Salvador has the highest score for relative life expectancy (RLEXP), while Nicaragua ranks 4th on this indicator. These high scores are probably due to the civil wars that these countries had just gone through. Some former socialist countries (Poland, Hungary) also do well on this indicator. The relatively low life expectancy for men in these countries can probably be explained by high alcohol abuse among men. In the US, the high score may be due to criminality, which has more victims among men.

With respect to relative female labour market participation (REAP), Rwanda

comes in first place, followed by Mozambique and Benin. It is clear that statistical conventions in these countries allow for including women who work as unpaid family members in subsistence agriculture in the registered labour force. In other countries, like Guatemala or the earlier mentioned Mali, this is probably not the case. Although this obviously distorts the results, the inclusion of the other labour market variable STPAM corrects the distortion to some extent.

5.1 Further analysis

When trying to combine a smaller number of indicators in one Index, the distortions caused by disadvantages of particular indicators come to the fore more sharply. For example, a subset of three indicators that includes life expectancy brings El Salvador to a much higher position. Subsets that include two labour market variables in addition to education give higher results for the former socialist countries. An Index combining REDUC, STPAM and SPAR gives a similar rank as SIGE5.

In order to examine the relationships between these indicators, I used the transformed data (where applicable) for the five variables. Table 4 presents the correlation coefficients between these (transformed) five indicators. Relative access to education (REDUC) proves to have rather high and statistically significant correlations with relative life expectancy (RLEXP), female share in parliament (SPAR) and, above all, with female share in technical and professional, and administrative and management positions (STPAM). Surprisingly, the correlation between REDUC and REAP proves to be almost zero and is statistically insignificant.

The relative female/male activity rate (REAP) proves to have a rather low (22%) but significant correlation with STPAM. The relationship between relative life expectancy and the two labour market indicators is positive and significant, but not very high. It is higher for STPAM than for REAP. This does not rule out the possibility of a trade-off between a higher work burden as reflected in participation in the labour market and women's relative health, but it seems that relative labour market participation and relative health also move together. They appear to be related more if we deal with participation in white-collar jobs than for jobs in general. The female share in parliament has a positive and significant correlation (ranging between 32 and 46%) with all other indicators.

Table 4.

Linear bivariate correlation coefficients between SIGE5 and components, in percent

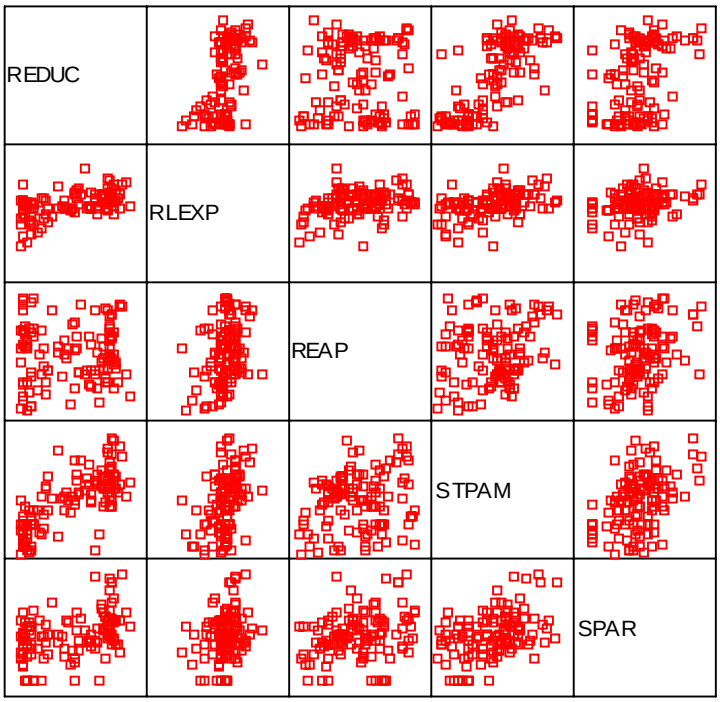
	REDUC	RLEXP	REAP	STPAM	SPAR	SIGE5
REDUC		52**	2	73**	43**	78**
RLEXP	52**		34**	40**	34**	71**
REAP	2**	34**		22**	46**	51**
STPAM Table	73**	40**	22**		38**	81**
SPAR	43**	34**	46**	38**		69**
SIGE5	78**	71**	51**	81**	69**	

** Correlation is significant at 0.01 level.

As could be expected, the correlation between the overall index SIGE5 and its components is high and significant. It is highest for STPAM and REDUC, and lowest for REAP. The presence or absence of linear relationships between the components is also confirmed in figure 1, which shows bivariate scatter plots. By looking at the plots, non-linear relationships can be discerned. The plot for REAP with REDUC confirms the heterogeneous nature of data on relative economic activity rate: in many countries, a high score means that women are highly represented in the agricultural subsistence sector or as unpaid family workers, with low education; in other countries, it points to a high participation in the formal labour market and it is accompanied by high relative education. The relationship has the form of a “U”. There is high relative labour market participation at low relative education levels, and at high relative educational levels, while it is low at middle educational levels.

Goldin (1994) found a U-shaped relationship between economic development, measured as GDP per capita, and a related indicator, namely (absolute) female labour market participation, and she explains it as follows. At low levels of development female labour market participation is high but is concentrated in agricultural activities. When education begins to become available, boys benefit first. General income levels increase but female labour market participation decreases both because of the (family) income effect and because of a "stigma" (taboo) on married women's outside work. At higher levels of income, girls also get access to education. In addition, the service sector expands. The stigma is weaker for the service sector than for manufacturing. These two factors explain the right side of the "U".

Figure 1. Scatter plot of bivariate relationships between the five components of SIGE.



5.2 Gender equality and economic development

Finally, we want to investigate whether there is a relationship between gender equality and macroeconomic performance. For macroeconomic performance, we used gross domestic product per capita figures, in purchasing power parity (PPP) dollars, as given in the WISTAT database (data from the UN National Accounts Database). The SIGE proves to have an approximately normal distribution. The logarithm of GDP per capita was taken in order to approach a normal distribution for the income variable. Our simple model is therefore as follows:

$$LGDPC = \beta_1 + \beta_2 \, SIGE + \varepsilon$$

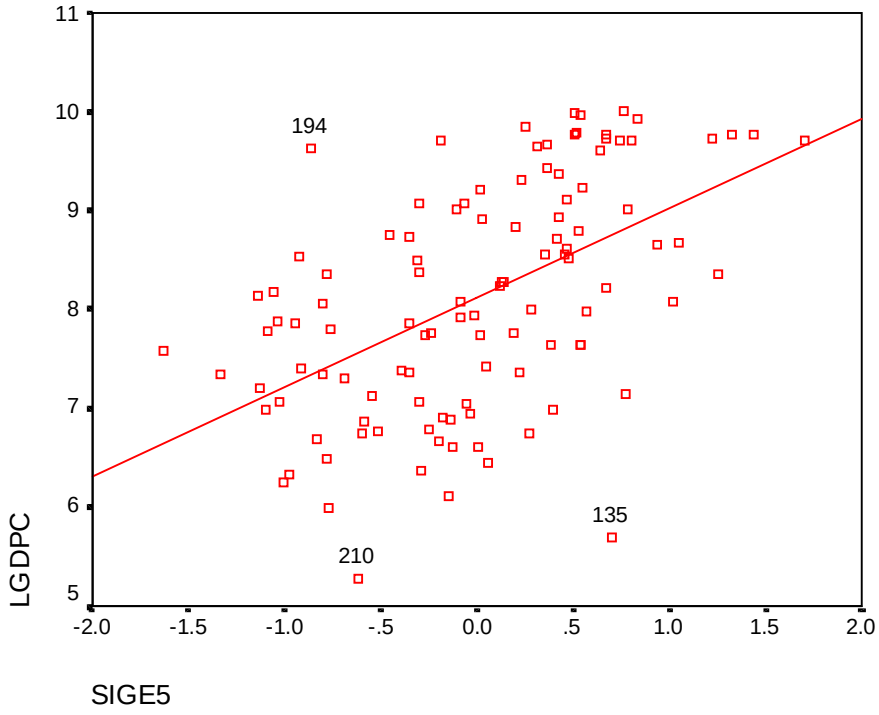
When regressing income per capita (LGDPC) on SIGE, the results are as follows (t values in parenthesis):

$$\begin{array}{lll} LGDPC = & 8.12 + & 0.91 \, SIGE \\ & (86.89) & (6.51) \end{array}$$

$$N = 112 \qquad \text{adj. } R^2 = 0.27$$

This gives a positive and highly significant slope coefficient of .91. This means that a one full point increase in SIGE is accompanied by 91% growth in income per capita. The relationship proves to be approximately linear (figure 2). Although these results confirm the theoretical section of this paper, no definite conclusions can be drawn on causality. It may also be the case that a higher level of income per capita leads to more gender equality. Furthermore, it cannot be stated that GDP p.c. is *only* influenced by gender equality. Many more variables should probably be included in the model.

Figure 2. Scatter plot of logged GDP per capita (LGDPC) against SIGE.



Nicaragua (135) is a clear outlier (residual is more than three times the standard deviation), with a much lower GDP per capita than expected according to its level of gender equality. The relatively high gender equality of Nicaragua can be explained by public policies carried out under the Sandinista government in the 1980s and probably also by the strength of the women's movement in that country.[5] Zaire (210) also has a relatively low GDP per capita as compared to its gender equality. On the other side we find the United Arab Emirates (194) with relatively high GDP and low gender equality.

6. CONCLUSION

The paper has examined the relationship between economic development and gender equality. It showed that there are good theoretical reasons to assume that more gender equality leads to higher levels of development. The current allocation of labour market positions over men and women, the distribution of paid and unpaid work, and the distribution of assets within households, is not based on economic efficiency motives. I also showed that the measures of gender inequality developed so far (GDI and GEM, see UNDP 1995) are not suitable for examining this relationship. The main problem is that absolute levels of development weigh heavily in both these measures. There are also methodological problems with the construction of the composite indices.

The second part of the paper develops a measure of gender equality that attempts to encompass many possible dimensions of gender equality and that avoids the conceptual and methodological problems. Obviously, this "Standardised Index of Gender Equality" (SIGE) is not the ultimate measure of gender equality. More data are necessary, in particular, on time use. Another limitation is that most data are for around 1990, which is already dated. However, SIGE can serve as a first approximation of such an overall index, and it has been constructed according to a much better methodology than earlier internationally comparable indices.

There proves to be a very strong and significant positive relationship between this measure of gender equality and economic development. This confirms the expectations of the theoretical section of the paper. Causality, however, may also run the other way: gender equality may increase at higher levels of economic development.

ENDNOTES

1. Not between middle and high income levels, since high incomes are adjusted.
2 They propose two further alternatives; one solves the problem of the unequal punishing of inequality at different GDP per capita, and the other excludes the problematic income component alltogether. However, the alternatives are still no measure of gender inequality as such.
3. See Wieringa (1997a). The Workshop, financed by the Directorate General for International Cooperation (DGIS) of the Dutch Ministry of Foreign Affairs, was the first step of a research project that aims at assessing the GDI and GEM indicators for these four countries. The country choice is related to the Agreements on Sustainable Development that the Dutch government has concluded with Benin, Bhutan and Costa Rica.
4. Given the longer working hours of women in almost all societies, it appears to make more economic sense to provide women with more food and more health services.

5. These policies favoured women's access to primary health care and education, and led to improvements in the legal status of women (Dijkstra 1998). The low level of GDP is mainly due to prolonged civil war and to economic policy failures (Dijkstra 1999).

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Appendix Table. Countries ranked according to SIGE, with scores and ranks (in italics) on five components.

Country	*REDUC*		*RLEXP*		*REAP*		*SPTAM*		*SPAR*		*SIGE5*
1 Finland	102.9	*3*	111.4	*5*	83.4	*8*	55.7	*8*	39.0	*1*	1.70
2 Sweden	100.7	*18*	108.0	*40*	78.2	*15*	63.6	*1*	33.5	*4*	1.44
3 Denmark	100.7	*19*	108.4	*36*	77.9	*16*	56.0	*7*	33.0	*5*	1.33
4 Poland	99.7	*31*	112.7	*2*	80.1	*13*	59.1	*4*	9.3	*42*	1.25
5 Norway	100.3	*21*	109.3	*20*	68.3	*21*	49.8	*14*	35.8	*3*	1.22
6 Hungary	100.1	*23*	112.4	*3*	76.3	*17*	52.4	*11*	7.3	*56*	1.05
7 Jamaica	102.3	*4*	106.3	*74*	83.3	*9*	59.6	*3*	12.4	*26*	1.01
8 Bulgaria	92.9	*54*	109.3	*22*	85.3	*5*	54.1	*9*	12.9	*22*	0.94
9 Canada	100.0	*25*	109.3	*21*	64.8	*29*	49.4	*15*	13.2	*21*	0.83
10 Austria	100.8	*15*	109.4	*18*	61.6	*35*	39.3	*49*	21.1	*8*	0.81
11 Barbados	99.3	*34*	107.0	*60*	82.0	*10*	45.5	*25*	14.3	*19*	0.78
12 Guyana	96.7	*46*	109.4	*19*	33.6	*88*	45.1	*26*	36.9	*2*	0.77
13 United States	100.1	*24*	109.7	*14*	67.2	*24*	46.2	*22*	10.3	*37*	0.76
14 Germany	98.4	*39*	109.0	*27*	60.2	*39*	42.1	*38*	20.0	*10*	0.74
15 Nicaragua	103.9	*2*	111.9	*4*	33.8	*86*	38.2	*53*	16.3	*14*	0.70
16 Netherlands	100.0	*26*	108.8	*30*	44.1	*66*	38.1	*54*	28.0	*6*	0.67
17 France	101.3	*10*	111.4	*6*	64.4	*30*	40.9	*43*	5.7	*68*	0.67
18 Romania	102.3	*5*	109.0	*26*	84.9	*6*	43.4	*32*	2.9	*93*	0.67
19 New Zealand	100.4	*20*	108.6	*32*	53.0	*51*	42.6	*36*	16.5	*13*	0.64
20 Suriname	101.2	*11*	107.5	*51*	41.2	*71*	62.5	*2*	5.9	*66*	0.57
21 Cuba	101.0	*12*	104.8	*97*	48.0	*61*	47.1	*19*	22.8	*7*	0.55
22 Trinidad and Tobago	98.2	*40*	107.4	*53*	42.7	*68*	49.0	*16*	17.7	*11*	0.54
23 Luxembourg	100.8	*13*	110.6	*9*	45.1	*63*	35.6	*64*	13.3	*20*	0.54
24 Philippines	99.8	*30*	106.1	*82*	45.8	*62*	57.6	*6*	11.2	*34*	0.54
25 El Salvador	93.8	*53*	115.1	*1*	33.9	*85*	40.7	*45*	8.3	*48*	0.54
26 Yugoslavia (former)	91.5	*57*	108.1	*38*	62.2	*33*	44.7	*28*	15.6	*17*	0.53
27 Belgium	100.0	*27*	109.2	*23*	48.9	*59*	43.4	*33*	10.1	*38*	0.52
28 Switzerland	99.0	*37*	109.2	*24*	54.9	*45*	33.5	*70*	15.9	*15*	0.50
29 Australia	100.7	*16*	108.7	*31*	61.4	*36*	33.3	*71*	12.6	*24*	0.50
30 Thailand	97.0	*44*	108.0	*41*	81.1	*11*	43.9	*30*	3.7	*88*	0.48
31 Uruguay	100.8	*14*	109.4	*17*	43.7	*67*	50.8	*13*	4.6	*80*	0.47
32 Portugal	91.2	*58*	110.1	*12*	52.6	*52*	47.5	*18*	8.7	*45*	0.46
33 Botswana	84.1	*70*	110.8	*8*	50.7	*56*	58.5	*5*	5.0	*77*	0.46
34 Venezuela	98.9	*38*	109.2	*25*	38.9	*74*	46.6	*21*	9.2	*43*	0.43
35 Ireland	101.4	*8*	107.9	*42*	42.0	*70*	41.4	*41*	12.4	*25*	0.42
36 Argentina	101.7	*7*	110.0	*13*	38.3	*76*	46.7	*20*	4.6	*81*	0.41
37 Swaziland	95.3	*50*	106.7	*68*	62.0	*34*	51.7	*12*	5.7	*67*	0.39
38 Lesotho	90.6	*60*	109.0	*28*	71.7	*18*	53.4	*10*	1.5	*102*	0.39
39 Italy	99.0	*36*	108.9	*29*	45.0	*65*	41.3	*42*	8.6	*46*	0.37
40 Spain	99.3	*35*	108.5	*34*	31.5	*91*	41.7	*39*	14.6	*18*	0.36
41 Chile	99.9	*29*	110.3	*11*	39.1	*73*	41.5	*40*	6.0	*65*	0.36
42 United Kingdom	100.7	*17*	107.7	*46*	60.3	*38*	33.6	*69*	7.3	*57*	0.31
43 China	81.2	*71*	104.4	*99*	80.7	*12*	36.7	*59*	21.0	*9*	0.28

44 Rwanda	67.5	*84*	107.1	*59*	89.1	*1*	31.3	*77*	17.1	*12*	0.27
45 Japan	100.3	*22*	107.6	*49*	59.2	*40*	33.3	*72*	6.4	*62*	0.25
46 Israel	97.1	*42*	104.9	*95*	50.6	*57*	47.7	*17*	9.2	*44*	0.23
47 Honduras	101.3	*9*	106.7	*67*	23.3	*103*	44.9	*27*	11.7	*30*	0.22
48 Mexico	95.6	*47*	109.7	*15*	37.3	*78*	38.8	*51*	7.3	*55*	0.20
49 Dominican Rep.	104.4	*1*	106.6	*70*	17.8	*108*	43.6	*31*	10.0	*39*	0.19
50 Costa Rica	99.9	*28*	106.3	*75*	28.3	*93*	39.5	*48*	12.3	*27*	0.13
51 Panama	99.7	*32*	105.6	*93*	38.7	*75*	44.5	*29*	7.5	*53*	0.13
52 Colombia	101.9	*6*	108.5	*33*	28.3	*94*	39.7	*46*	4.6	*83*	0.12
53 Burundi	64.6	*86*	107.3	*56*	86.4	*4*	28.8	*81*	9.9	*41*	0.06
54 Zimbabwe	88.4	*64*	106.2	*80*	52.3	*54*	36.1	*60*	11.6	*33*	0.04
55 Indonesia	87.4	*65*	106.0	*84*	45.1	*64*	39.3	*50*	12.2	*29*	0.02
56 Mauritius	91.8	*56*	110.6	*10*	35.4	*83*	38.5	*52*	3.0	*91*	0.02
57 Cyprus	95.6	*48*	105.9	*88*	55.4	*44*	36.0	*61*	5.4	*73*	0.01
58 Haiti	89.8	*62*	106.3	*77*	69.7	*19*	37.9	*55*	3.0	*92*	0.01
59 Sri Lanka	94.3	*52*	106.2	*79*	36.9	*79*	45.8	*24*	4.9	*78*	-0.01
60 Mozambique	43.5	*110*	107.4	*55*	88.9	*2*	16.8	*106*	15.7	*16*	-0.04
61 Benin	41.2	*111*	107.5	*52*	87.5	*3*	29.4	*80*	6.3	*64*	-0.06
62 Korea, Repu	90.5	*61*	109.5	*16*	52.0	*55*	36.0	*63*	1.0	*104*	-0.07
63 Ecuador	97.0	*43*	106.6	*71*	24.2	*101*	42.9	*35*	5.2	*75*	-0.08
64 Paraguay	95.0	*51*	106.6	*72*	26.1	*98*	43.2	*34*	5.6	*70*	-0.09
65 Greece	92.2	*55*	107.0	*61*	35.2	*84*	39.5	*47*	5.3	*74*	-0.11
66 Central Africa	48.4	*104*	111.4	*7*	79.8	*14*	18.0	*104*	3.9	*86*	-0.13
67 Guinea-Bissau	35.6	*114*	107.9	*44*	65.4	*27*	25.6	*86*	12.7	*23*	-0.14
68 Burkina Faso	44.3	*109*	107.7	*48*	84.3	*7*	25.6	*85*	5.6	*69*	-0.15
69 Ghana	53.7	*101*	106.8	*66*	64.8	*28*	33.8	*68*	7.5	*52*	-0.18
70 Singapore	87.2	*66*	107.8	*45*	49.0	*58*	31.9	*73*	3.7	*87*	-0.19
71 Myanmar	86.9	*67*	106.2	*81*	58.9	*42*	37.8	*56*	1.8	*99*	-0.19
72 Bolivia	74.8	*78*	108.1	*39*	33.7	*87*	37.7	*57*	7.0	*58*	-0.24
73 Gambia	48.2	*106*	107.7	*47*	65.4	*26*	25.5	*87*	7.8	*49*	-0.25
74 Peru	86.0	*68*	106.5	*73*	32.3	*90*	36.9	*58*	6.4	*61*	-0.27
75 Malawi	61.2	*92*	103.4	*104*	68.0	*23*	31.6	*75*	11.6	*32*	-0.29
76 Iraq	78.0	*74*	104.7	*98*	28.5	*92*	42.6	*37*	10.8	*35*	-0.30
77 Fiji	95.6	*49*	106.1	*83*	25.5	*100*	35.5	*65*	3.9	*85*	-0.30
78 Malta	99.3	*33*	106.2	*78*	27.9	*97*	35.3	*66*	1.5	*103*	-0.30
79 Brazil	96.9	*45*	108.5	*35*	37.6	*77*	13.6	*113*	5.5	*71*	-0.31
80 Malaysia	84.2	*69*	106.0	*85*	54.8	*46*	20.5	*101*	7.6	*50*	-0.35
81 Cape Verde	78.4	*73*	103.1	*105*	36.5	*80*	46.2	*23*	7.6	*51*	-0.35
82 Guatemala	77.6	*75*	107.9	*43*	20.0	*106*	40.9	*44*	5.2	*76*	-0.35
83 Cameroon	72.8	*80*	105.8	*90*	48.7	*60*	22.2	*96*	12.2	*28*	-0.39
84 Equatorial	64.6	*87*	107.2	*58*	64.3	*31*	25.0	*91*	3.3	*90*	-0.41
85 Turkey	75.9	*76*	108.3	*37*	53.6	*49*	23.7	*93*	1.8	*100*	-0.46
86 Togo	46.0	*107*	106.9	*65*	55.9	*43*	20.7	*100*	6.3	*63*	-0.51
87 Senegal	55.4	*100*	104.3	*100*	63.5	*32*	15.8	*109*	11.7	*31*	-0.55
88 Lebanon	79.2	*72*	106.0	*86*	36.3	*81*	31.9	*74*	2.3	*95*	-0.57
89 Zambia	75.7	*77*	103.8	*103*	40.4	*72*	29.7	*79*	6.7	*60*	-0.59
90 Nigeria	58.6	*96*	107.0	*62*	52.3	*53*	25.4	*89*	2.1	*98*	-0.60
91 Zaire	56.2	*98*	106.9	*64*	53.7	*48*	16.1	*107*	5.4	*72*	-0.62
92 Cote d'Ivoire	57.6	*97*	106.7	*69*	53.8	*47*	14.2	*112*	4.6	*82*	-0.69

93	Solomon Islands	68.2	*82*	106.0	*87*	61.4	*37*	25.1	*90*	0.0	*110*	-0.76
94	Ethiopia	59.2	*95*	107.4	*54*	59.0	*41*	22.7	*94*	0.0	*111*	-0.77
95	Liberia	41.0	*112*	103.9	*102*	42.6	*69*	22.7	*95*	6.8	*59*	-0.79
96	Kuwait	90.9	*59*	105.1	*94*	23.5	*102*	34.0	*67*	0.0	*108*	-0.79
97	Jordan	89.2	*63*	105.7	*92*	12.1	*111*	30.4	*78*	0.8	*106*	-0.80
98	Djibouti	56.1	*99*	107.0	*63*	68.6	*20*	17.4	*105*	0.0	*115*	-0.80
99	Sudan	50.5	*102*	104.9	*96*	28.2	*95*	27.3	*82*	4.6	*79*	-0.83
100	United Arab Emirates	97.7	*41*	106.3	*76*	14.0	*110*	21.4	*97*	0.0	*112*	-0.87
101	Papua New Guinea	67.7	*83*	102.7	*107*	68.1	*22*	25.4	*88*	0.0	*109*	-0.91
102	Syrian Arab Rep.	61.7	*91*	105.9	*89*	21.4	*105*	12.9	*114*	8.4	*47*	-0.93
103	Algeria	65.6	*85*	103.1	*106*	10.6	*113*	25.7	*84*	10.0	*40*	-0.94
104	Mali	48.2	*105*	107.6	*50*	18.3	*107*	19.0	*103*	2.3	*96*	-0.98
105	Comoros	74.4	*79*	101.9	*110*	66.6	*25*	20.9	*99*	0.0	*113*	-1.01
106	Nepal	35.6	*113*	97.6	*115*	53.5	*50*	36.0	*62*	2.6	*94*	-1.03
107	Morocco	49.9	*103*	105.8	*91*	26.1	*99*	24.7	*92*	0.7	*107*	-1.04
108	Iran	70.7	*81*	100.8	*111*	22.9	*104*	31.4	*76*	3.5	*89*	-1.05
109	Egypt	64.3	*88*	104.2	*101*	11.5	*112*	27.2	*83*	2.2	*97*	-1.09
110	Mauritania	59.5	*94*	107.3	*57*	27.9	*96*	19.7	*102*	0.0	*114*	-1.10
111	India	63.8	*90*	100.2	*112*	36.0	*82*	15.9	*108*	7.3	*54*	-1.13
112	Tunisia	63.9	*89*	102.4	*108*	32.7	*89*	14.3	*111*	4.3	*84*	-1.14
113	Bangladesh	60.4	*93*	98.6	*114*	8.4	*115*	21.4	*98*	10.3	*36*	-1.34
114	Afghanistan	27.7	*115*	102.4	*109*	9.9	*114*	12.5	*115*	1.7	*101*	-1.54
115	Pakistan	45.7	*108*	100.0	*113*	15.4	*109*	15.8	*110*	1.0	*105*	-1.63